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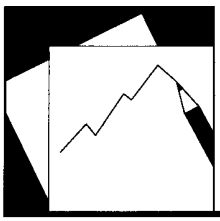

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Policy Credibility and Sovereign Credit: The Case of the New EU Member States

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Abstract

References to policy credibility, particularly with regard to fiscal policy, are ubiquitous in both economic literature and financial markets, even though it is not directly observable. The case of the EU new member states (NMS)—emerging markets joining a supranational entity that is generally considered to have higher policy credibility—provides a unique experiment to assess the effects of credibility on sovereign credit. This paper examines the impact of EU accession on three key variables that can reflect in varying degrees policy credibility: sovereign ratings, foreign currency spreads, and local currency yields. The results suggest that the NMS appear to have enjoyed higher credibility compared to their peers.

JEL Classification Numbers: G12, H3, H6

Keywords: Policy credibility, credit spreads, sovereign ratings, new EU member states

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I. INTRODUCTION

Credibility of policy is crucial for its effectiveness. It also plays a critical role in the assessment of sovereign credit risk by rating agencies and investors, as published rating guides (Standard and Poor's, 2005) and fixed income textbooks (e.g., Fabozzi, 2004) suggest. Reflecting its importance, it has been a centerpiece of the economic policy literature (see, for instance, Kydland and Prescott, 1977; Cukierman and Meltzer, 1986; Dornbusch, 1991). However, credibility by definition is not directly observable. In the econometric studies of the determinants of ratings and spreads, it is subsumed in the fixed effects or error term.

This paper uses the unique real-world experiment provided by the new member states' (NMS)[2] accession to the European Union (EU) to examine the impact of credibility on the perceived risk of sovereign credit. The key idea is that EU accession, and the expectation of eventual euro adoption, could set the NMS apart from other emerging markets, a peer group they are otherwise generally included in: the NMS received an exogenous credibility infusion through the inclusion in a supranational body whose policy credibility is generally considered superior to that of most emerging markets, including that pertaining to the NMS themselves. This experience is similar to that of some of the current EMU members in their EMU run-up.

The question whether credibility, particularly on the fiscal front, affects sovereign credit has important policy implications. At a general level, a helpful effect of policy credibility on sovereign spreads could increase the room for policy flexibility in response to exogenous shocks, and strengthen the effect of market discipline on policy conduct. Specifically for the NMS, the exogenous credibility infusion could help explain the apparent discrepancy in some countries between weak fiscal and external positions and limited market concerns.

We test the effect of unobserved credibility by proxying it with EU membership in empirical models for ratings, foreign-currency spreads, and local currency yields, contrasting the NMS with other emerging markets, and applying structural break tests to gauge when such effects emerged. Identification of the credibility effect obviously requires controlling for other possible factors that could differentiate the NMS from other emerging markets. In addition to this test of the credibility effect, we extend the literature on ratings and spreads (e.g., Dell'Ariccia and others, 2006; Eichengreen and Mody, 1998; Mauro and others, 2006; Zoli, 2004) in two ways: (i) we examine the foreign-currency spreads of most NMS, not only of those in the EMBI index; and (ii) we analyze emerging market sovereign ratings, foreign currency spreads, and local currency yields in an integrated approach. Our results suggest that the NMS appear to have enjoyed higher policy credibility compared to their peers.

The paper proceeds as follows. Section II explores the nexus between policy credibility and borrowing costs. Section III discusses why EU membership of the NMS may be interpreted as a proxy for the unobserved credibility variable. Section IV presents testing strategy, data, and estimation issues. Section V provides the results and Section VI some conclusions.

[2] As standard usage, NMS refers to the central and eastern European countries that joined the EU in May 2004.

II. Policy Credibility and Sovereign Credit

Standard models of policy credibility (Drazen and Masson, 1994; Dornbusch, 1991) define it as the expectation that an announced policy will be carried out. These models postulate the preferences of a policymaker and analyze factors that determine whether announced policies will be carried out under different states. Credibility could mean agents' belief that good policies will be maintained, or that a promise to end bad policies will be kept. Alternatively, it could imply agents' belief that policy will be conducted such that stated objectives are met. On the level of fiscal policy, credibility could mean agents' belief that certain fiscal targets will be achieved, or that a sustainable fiscal position will be maintained, i.e., that government budget constraint would be met without resort to inflation or default.

Several conditions for policy credibility can be defined. First, compatibility of various policy targets: otherwise, policy is unlikely to be sustainable and so not credible. Second, time consistency, i.e., that policy will be sustained under (nearly) all circumstances and will not be changed opportunistically; policy rules may be needed to ensure time consistency. Third, information availability, without which economic agents may be unable to monitor policy and assess whether policy changes are taking place; the lack of monitoring, in turn, could increase the government's scope to abandon good policies or adopt bad ones.

Credible policies bring substantial benefits for policymakers by making it easier to achieve desired policy objectives if, as in Cukierman and Meltzer (1986), credibility as defined as the speed with which the public is convinced that new policies have been adopted (when this is the case). This is related to the observations that agents' expectations affect policy outcomes, and that expectations, in turn, depend on policy credibility. For example, credible monetary policy makes it less costly to reduce inflation, or to refrain from an immediate policy response to temporary inflation shocks that would raise inflation expectations if monetary policy were less credible. Similar benefits accrue to policy makers when fiscal policy is credible. For example, they have more flexibility to use temporary fiscal stimulus without worries of rising borrowing costs resulting from an adverse financial market reaction.

In this vein, policy credibility is likely to affect the perceived quality of sovereign credit. If policies are "good," they will presumably reduce borrowing costs more if markets believe that they will remain good in the future. Moreover, if policies are "bad," but the government has announced that it is likely to improve them, credibility may help to speed up the change in market expectations about future policies. Conversely, if policies have been good but are deteriorating, credibility may delay the change in market expectations.[3] Finally, if policies have been good, but the government announces that it will temporarily deviate from past policies, e.g., to counteract a severe economic shock, credibility can help anchor long-term market expectations despite the temporary deviation from the norm.

[3] Since Kydland and Prescott (1977), the argument typically has been that credibility takes time to build and can be lost instantly. We do not argue that credibility cannot be lost quickly, it usually will. However, if a country has a reputation of good policies, it can "get away" with temporary deviations before a loss of credibility occurs. In contrast, countries with less stellar reputation could lose credibility more rapidly after the policy shift.

III. THE CASE OF THE NEW MEMBER STATES

The NMS make an interesting case study of the effect of policy credibility on borrowing costs. A number of them have seen stubbornly high budget deficits and rapidly growing debt in recent years. Weak fiscal discipline has also been reflected in the repeated failure to implement Convergence Programs and ensuing delays in euro adoption. However, the market reaction to these developments has remained muted, even as euro adoption has been postponed. As one consequence of this benign situation, average effective interest rates on NMS public debt have behaved inversely to the rapidly growing debt stock (see Figure).

It is certainly well-known that markets deal kindly with large deficits in advanced economies. Indeed, the absence of an apparent impact of the pervasive deficits in many of the largest of them led some observers to suggest that "deficits don't matter." Although there is evidence that the impact of fiscal policy on interest rates has only been offset by other factors (Hauner and Kumar, 2006), in any case most studies have found this effect to be limited or even statistically insignificant (surveys in Gale and Orszag, 2003; European Commission, 2004).

However, emerging markets usually receive much harsher rebuke from markets for unsound fiscal policy (see the studies cited in Section I). This begs the key empirical question of this paper, namely what accounts for the mild financial markets reaction deteriorating public finances in the NMS: the generally benign financial market conditions for emerging markets in recent years (see Hauner and Kumar, 2005), independent of individual countries' policies; or factors that differentiate the NMS from other emerging markets and may justify a better treatment from markets' point of view. Among the latter, there are two main possibilities.[4]

One possibility is that markets could expect a bailout of profligate EU members, either by the ECB or by other EU members, but it is difficult to find much support for such expectation. To be sure, the evidence on whether or not markets expect such a bailout is hard to come by: Faini (2006) concludes that it is not possible to draw conclusions about market expectations about future bailout policies from an analysis of the yield spreads within the Euro Area. More important, the legal EMU framework explicitly prohibits bailouts.[5] From a political economy perspective, it would be difficult to justify a bailout of a profligate member state. As argued in Rodden (2006), bailouts in federal entities are most likely when lower-level governments are highly dependent on transfers or loans from the higher-level government, especially when there is an implicit or explicit guarantee of equal service provision. In the event of default, the central government would find it hard to resist political pressure for bailouts. However, the center can more credibly distance itself from local fiscal crises when local governments are funded through local taxation and can realistically be viewed as sovereigns as the NMS.

[4] Given the less-than-stellar record of fiscal performance in most of the accession countries, we would discount the possibility that the credibility has been developed domestically in the NMS.

[5] Article 101 of the Maastricht Treaty prohibits direct financing of public entities by the ESCB; Article 102 prohibits privileged access of such entities to financial institutions; and Article 103 stipulates that neither the Community, nor the member states are liable for the commitments of other member states.

Moreover, given their relatively small size, spillovers from a default of an NMS on the rest of the EU are likely to be limited, thus eliminating the other main possible reason for a bailout.

A more likely possibility is that EU accession and the prospect of euro adoption bestow more policy credibility to the NMS than other emerging markets. Asset prices reflect both current policies and expectations of future policies. Current weak fiscal policies may play only a limited role in determining sovereign bond prices because policies may be expected to improve significantly, early enough to avoid the accumulation of debt to a level where the budget constraint would have to be met through inflation, default, or debt restructuring.

EU accession of the NMS has arguably improved all three conditions for policy credibility specified in Section II.[6]

- (i) The Stability and Growth Pact should ensure time consistency of policies. While enforcement has been weak for larger countries in the past, there is a wide sentiment that smaller countries, particularly net recipients of EU transfers like the NMS, would be allowed less leeway. Moreover, even if the fiscal targets are not fully adhered to, monetary financing will be precluded by euro accession, which, although perceived as an option, is a legal requirement for members.

- (ii) Accession has improved target compatibility, as all members have to submit annual Convergence Programs (CPs) formulating medium-term policy objectives and specifying policies to achieve them; the CPs' review by the European Commission and peer pressure promote target compatibility.

- (iii) Information availability has been improved by the publication and public scrutiny of the CPs, and the monitoring of economic and public finance data by Eurostat. Better information, as well as EU commitments, could also reduce domestic political obstacles to fiscal adjustment.

[6] A question could be asked whether it is EU membership alone or the associated obligation to adopt the euro that affects positively policy credibility. Even without the EMU, there are a number of reasons why EU membership is likely to increase credibility. For example, the common fiscal policy framework increases fiscal transparency and peer pressure (reputational aspects in the club). Also, there is the unspoken possibility that the rich countries could reduce transfers if the NMS as a group are being seen as "badly behaved." Adopting the euro requires to meet two additional conditions: Maastricht fiscal criteria and avoidance of excess deficits. Maastricht criteria constrain fiscal policy only until the euro adoption, but excess deficit rules should be binding permanently. Hallerberg and Wolff (2006) show that the effect of deficits on sovereign spreads is less under EMU and find a positive role of EMU financial institutions on sovereign risks premiums of existing EMU members. Therefore, similar positive effect could be expected in case of prospective members.

In fact, the NMS would not be the first countries to benefit from a credibility effect stemming from EU accession. Preceding the creation of the euro, large fiscal adjustment took place in several countries, and while all these countries have seen deficits beyond 3 percent of GDP since euro adoption, fiscal discipline has still improved relative to the years before the euro. Schadler and others (2005) estimated that the convergence of interest rates to the level of core EU countries reduced interest costs of public debt by 2.5–5.0 percent of GDP in Italy, Greece and Portugal. It is likely that markets expect similar improvements in policies for the NMS, a fact that would differentiate them from other emerging markets.

To be sure, EU membership affects macroeconomic outcomes in the NMS through other channels than its effect on policy credibility as well. However, to interfere with the proper identification of the credibility effect in our empirical strategy, such factors would have to be omitted from our control variables, and have a significant bearing on sovereign credit, which is theoretically determined only by factors that affect solvency and liquidity of the debtor. This is not the case for the closest alternative explanations for what sets the NMS apart from other countries: (i) EU membership may boost growth through transfers, investment, and trade, but growth per se is not a theoretical determinant of solvency or liquidity and does not turn out as an empirically significant variable in our econometric specification. (ii) Transfers from the EU may provide funding, but to the extent that they improve government balances (which is debatable), this effect would be captured by the fiscal variables in our regressions. (iii) The NMS' financial systems may be sounder than in other emerging markets, but this is generally seen as a consequence of dominant foreign bank ownership, which, in turn, is arguably a consequence of EU-related credibility that raised the confidence of foreign banks.

If it is the case that EU accession could affect NMS sovereign ratings and spreads through its impact on policy credibility, and not a bail-out expectation, accession (or the expectation of it) becomes a proxy for credibility useable in empirical analysis. Specifically, it can be tested whether NMS are treated differently by ratings agencies and markets than other emerging markets. The following section proceeds with a formal definition of a test of this hypothesis.

IV. Methodology and Data

In brief, our econometric strategy is to specify three models for sovereign ratings, foreign currency spreads, and local currency yields, respectively. We then include a dummy variable for NMS and its interactions with the variables identified in the preferred model. If these terms contain additional information (significant *t*- and *F*-tests), NMS are treated differently. Next, we check for structural breaks in these coefficients through the Quandt likelihood ratio (QLR) test to examine whether this different treatment appeared during EU accession.

A. Testing Strategy

Formally, consider the linear regression model in the tradition of Edwards (1984),

$$Y_{it} = \alpha + \beta_1 C_{it} + \sum_{k=2}^{K} \beta_k X_{kit} + \sum_{l=1}^{L} \gamma_l Z_{lt} + u_{it}, \qquad (1)$$

where Y_{it} is the perceived credit risk of country *i* in period t, α is a constant, β_k and γ_l are slope coefficients, C_i is the unobserved credibility of the policies of country i, X_{it} is a $1 \times K$ vector of observed country/period-specific controls (e.g., solvency indicators), Z_t is a $1 \times L$ vector of period-specific controls, and u_{it} is a serially uncorrelated error term.

In our regressions, we proxy Y_{it} alternatively by (i) agency ratings, (ii) foreign-currency spreads, and (iii) domestic-currency spreads. It should be noted that when Y_{it} represents domestic-currency spreads, the linearly approximated Fischer relationship requires that

$$N_{it} \approx N_t^* - E_t(\pi^*) + E_t(\pi) + E_t(s) + Y_{it}, \tag{2}$$

where N_{it} is the nominal yield on a local currency government bond, N_t^* is the interest rate on a foreign government bond of same maturity that is perceived to be risk free, $E_t(\pi^*)$ and $E_t(\pi)$ are the foreign and the domestic inflation rates between *t* and maturity as expected in period *t*, and $E_t(s)$ is the deprecation rate of the domestic currency between *t* and maturity as expected in period *t*.[7] Combining (1) and (2) yields

$$N_{it} \approx N_t^* - E_t(\pi^*) + E_t(\pi) + E_t(s) + \alpha + \beta_1 C_{it} + \sum_{k=2}^{K} \beta_k X_{kit} + \sum_{l=1}^{L} \gamma_l Z_{lt} + v_{it}. \tag{3}$$

Returning to the general case in (1), we need a proxy for unobserved credibility, specifically an observed country-specific variable that can be assumed to be orthogonal to the control variables. As discussed in Section III, we hypothesize that whether a country is a NMS *j*, or not, per se constitutes a valid proxy for the unobserved policy credibility. First, we consider the proxy to be a dummy variable λ, with $\lambda = 1$ if $i = j$ is a NMS and $\lambda = 0$ otherwise. However, it is not unlikely that credibility affects perceived credit risk not only through the intercept, but also the slopes: for example, a given increase in the debt/GDP ratio may affect the perceived credit risk more for a country with low credibility. Thus, second, we complement the credibility proxy with the interaction of the proxy with the control variables.

The null hypothesis that credibility does not affect perceived sovereign credit risk can then be tested by an *F*-test of joint significance of the coefficients α_j and β_{kj} in the regression model

[7] In principle, also tax differences would have to be accounted for, but no sufficient data is available; however, for industrial countries, Favero and others (1997) find that this factor only plays a negligible role. Moreover, as formulated here, the credit risk premium would also include the liquidity premium, if any. We will further discuss this issue in the empirical section.

$$Y_{jt} = \left(\alpha + \lambda\alpha_j\right) + \sum_{k=1}^{K}\left(\beta_k + \lambda\beta_{kj}\right)X_{kjt} + u_{jt}\,. \tag{4}$$

Thus, for the NMS it holds that

$$\frac{\partial E\left(Y_{jt} \mid X_{kjt}, \lambda X_{kjt}\right)}{\partial X_{kjt}} = \sum_{k=1}^{K}\left(\beta_k + \lambda\beta_{kj}\right)X_{kjt}\,, \tag{5}$$

while for the other countries it holds that

$$\frac{\partial E\left(Y_{it} \mid X_{kit}, \lambda X_{kit}\right)}{\partial X_{kit}} = \sum_{k=1}^{K}\beta_k X_{kjt}\,. \tag{6}$$

The null hypothesis that NMS are *not* treated differently by the markets can be formulated as

$$H_0 : \lambda = 0\,. \tag{7}$$

So far we have assumed that whether or not a country is a NMS is observable. However, if EU accession indeed lowers perceived credit risk, its effects depend on the expectation of future membership as much as on the actual fact. The problem is that expectations are again unobservable, and there is a multitude of dates from which on such an expectation could have begun to gain hold with investors. To search for evidence of a change in attitude of investors towards the NMS at an a priori undetermined point in time, we apply the Quandt likelihood ratio (QLR) test for structural breaks with unknown timing.

Suppose that β_j changes at date τ. If the date is known, testing the null hypothesis of no structural break is equivalent to testing whether the coefficients $\widetilde{\alpha_j}$ or $\widetilde{\beta_{kj}}$ are zero in

$$Y_{jt} = (\alpha + \lambda\alpha_j + \phi\widetilde{\alpha_j}) + \sum_{k=1}^{K}(\beta_k + \lambda\beta_{kj} + \phi\widetilde{\beta_{kj}})X_{kjt} + u_{jt}\,, \tag{8}$$

where $\phi = 1$ if $t > \tau$ and $\phi = 0$ otherwise. This test can be computed based on conventional *t*-and *F*-statistics from estimating (8) by OLS. If, as in our case, the break date is not known, the *t*-statistic can be computed for all periods within a range of possible break dates. If the largest of these values exceeds the adjusted critical value calculated by Andrews (1993),[8] the null hypothesis of no break can be rejected. The break point is then determined by the QLR test, which is essentially a rolling Chow test under an adjusted *F*-distribution where the period with the largest *F*-statistic is a consistent estimate of the true break period (Andrews, 1993).

[8] Adjustment is required because the test allows for multiple opportunities to reject the null hypothesis.

B. Data

The sample consists of the NMS, excluding Estonia which had no foreign currency bonds outstanding during the sample period. The control group consists of all emerging markets included in the EMBI in early 2006. We use monthly data from 1995M1–2005M12; both the period and the frequency are essentially determined by data availability.

We specify three dependent variables: ratings, foreign currency spreads, and local currency yields. The ratings variable is defined as the average of the Moody's and S&P foreign currency sovereign rating. The ratings are converted linearly[9] to numerical values, where the best ratings are assigned a value of –42, and the worst ratings a value of zero, to make sure that the expected signs in the ratings are consistent with those in the spreads regressions.

For the foreign currency spreads, we rely on the EMBI (see J.P. Morgan, 1999) where available.[10] However, among the NMS only Hungary and Poland have been included in the EMBI at least for some of the sample period. For the other NMS, spreads were constructed from individual bonds. We selected bonds as closely in line with the EMBI methodology as possible.[11] This approach should minimize the bias from not accounting for liquidity and maturity; in any case, other studies (e.g., Beber and others, 2006) found that credit quality explains a much larger share of sovereign yield differences than liquidity, particularly for issuers with more significant credit risk. As common in the literature (e.g., Schwert, 1989), bonds were connected by ratio splicing.[12] See the Appendix for more detail.

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[9] Linear transformation is most common in the literature; however, we also tried a nonlinear specification (see Table 3), but, as others (e.g., Ferri and others, 2003), we find virtually the same results as in the linear one.

[10] We use secondary market yields, in line with the majority of the literature. In principle, of course, the actual borrowing cost for the issuer is represented by primary market spreads, which were thus used by some studies (e.g., Eichengreen and Mody, 1998). However, primary market spreads result in far fewer observations, and, while all spreads introduce a simultaneity bias to the extent that high-spread countries borrow less, this bias is worse for primary market spreads because countries will try to defer issuance when spreads are very high. In sum, we believe that secondary market yields are the better proxy for a measure of risk.

[11] Only U.S.-dollar instruments; only relatively liquid instruments (although the EMBI limit could not always be observed); minimum maturity 12 months, and minimum maturity of 2.5 years at the time of inclusion in the sample; and daily quotes available. As some accession countries have not had any dollar issues outstanding during the sample period, euro-denominated issues had to be used. In theory, making them comparable to US-dollar issues would require adjustment for the yield curve differential; however, where both euro-denominated bonds and dollar-denominated bonds were available, we found that the spreads tracked each other more closely without such an adjustment, suggesting that the credit risk premium dwarfs the currency premium; we therefore use the unadjusted yield for the euro-denominated bonds.

[12] Given periods $t = 1 \ldots M \ldots T$ and two yield series x and y, the transformed series z that is spliced at period $t = M$ is given by $z_t = x_t$ for all $t \leq M$ and by $z_t = y_t \left(x_M / y_M \right)$ for all $t > M$. While splicing introduces its own problems, it is preferable to using the unadjusted series.

Can EMBI+, EMBI-G, and the computed spreads be considered to be the same? Ferrucci (2003) found that EMBI+ and EMBI-G are not statistically the same, but close enough to be included in the same model. We follow this approach and pool the EMBI+ and EMBI-G data. To examine whether EMBI and constructed spreads, in turn, can be reasonably pooled, we examine the comparability of the series for the four countries where we have both. While the null hypotheses of equal sample means and sample variances for EMBI and computed spreads are firmly rejected for each of the four countries, their high correlation (Hungary 0.88 and Poland 0.94) and the results of a panel regression of the EMBI on the computed spread and an intercept (slope coefficient close to unity; *t*-test and *F*-test significant at the 1 percent level; R-squared 0.76) make us comfortable with using them in one regression.

For the local currency yields, we use the long-term government bond yields from the IMF International Financial Statistics (IFS). For countries where no data is available from the IFS, but individual bonds are reported in Datastream, we compute our own series according to the same procedure described for foreign currency bonds. Critically, the expected exchange rate depreciation is unobserved and must be proxied. We would like to use the spread between interest rate swaps of the same maturity in different currencies, based on the argument that liquidity and credit risk for these contracts is very homogenous across countries (Favero and others, 1997; Codogno and others, 2003); however, swap markets have only been developing during the sample period in the emerging market countries we examine here, and they are often too small and too volatile to assume that their credit and liquidity risk is the same. In the absence of a good proxy for exchange rate expectations, we assume that they are determined by the same fundamentals as the sovereign spread, which is very plausible.

For the explanatory variables, the sources are the IMF World Economic Outlook database and IFS. Given that most macroeconomic data is available only at a less than monthly frequency, we use linear interpolation to fill the gaps, as common in the literature (e.g., Ferrucci, 2003; Goldman Sachs, 2000; Dell'Ariccia and others, 2006). Clearly, interpolation has the cost of imposing a model on the data-generating process of the missing observations. However, the cost of using only quarterly or even annual data, or, alternatively, using only the available high-frequency variables, would be much higher. Also, for the stock variables, which tend to be highly persistent, linear interpolation should not be too constraining. We select the explanatory variables by first filtering the main variables used in the literature on ratings and spreads through the GETS algorithm (see, e.g., Hendry and Krolzig, 2005) to narrow them down to a parsimonious model that maximizes the adjusted R-squared. Then, as we prefer for consistency to use similar models for our three independent variables, we add/delete some variables to maximize the models' combined explanatory power.

Table 1 summarizes our seven independent variables: debt/exports ratio; reserves/imports ratio; current account balance; government balance;[13] GNI per capita; inflation rate; and the past incidence of crises. Two more variables are only included in the regressions of foreign

[13] It would be desirable but is not possible to include a more encompassing measure of public liabilities including contingent and off-balance sheet (e.g., pension) liabilities.

currency spreads and local currency yields: the residual from the ratings regression to capture qualitative information such as institutions,[14] and the degree of general risk appetite measured by U.S. corporate bond spreads. Two more variables are included only in the local currency yield regressions: the real U.S. and (for the NMS) German 10-year government bond yield.[15]

C. Estimation Issues

It is worth noting that most of the previous literature has ignored the time series properties of the variables. Examining them results in some concerns, as the Levin, Lin, and Chu (2003) test, used here because of its high power derived from pooled regressions, suggests that the local currency yields, inflation, the ratings residual, and the EU and US real interest rates are *I*(1) (Table 1). We still follow the literature in estimating our three models in levels, but include a linear trend in all regressions. There is more concern about the local currency yields model as the dependent variable is *I*(1); however, it is cointegrated with the *I*(1) independent variables, and the relationship is thus not spurious.

As in most of the literature, we apply the pooled estimator to our panel. The mean group estimator (Pesaran and Smith, 1995) is not an option as it would be heavily biased by the large outliers typical for spreads. The pooled mean group (PMG) estimator (Pesaran and others, 1999) is unattractive in this case, because our own experiments, as well as the results in the two studies of EMBI spreads that use the PMG (Ferrucci, 2003; Goldman Sachs, 2000), suggest that the PMG has relatively weak explanatory power for spreads. This is in line with the finding in Baltagi and others (2000) that pooled estimators tend to outperform heterogeneous panel estimators, as the former rely more on the between variation and thus produce more stable parameter estimates, while the latter are more affected by idiosyncratic cross-section information; in this case, efficiency gains from pooling appear to more than offset the biases from cross-sectional heterogeneity.

Spreads and (less so) ratings are characterized by cross-sectional heteroskedasticity and serial correlation. To account for cross-section heteroskedasticity, feasible generalized least squares (FGLS) with cross-section weights are used, allowing for different residual variances across cross-sections. To address serial correlation, White period robust coefficient covariances are computed (Arellano, 1987; White, 1980). As to a possible multicollinearity bias, we exclude variables with cross correlations above 0.5, and most actually are below 0.3.

[14] This is common in the literature, for example, Eichengreen and Mody (1998).

[15] Obviously, these are not all variables that would be individually significant, but those that remained after the aforementioned GETS procedure. For example, the short-term debt/reserves ratio, which would have been our preferred liquidity indicator, turns out to be dominated by the reserves/imports ratio; or political events that may be expected to influence spreads were not found to be significant elsewhere (Akitoby and Stratman, 2006).

II. RESULTS

Tables 2–4 show recursive regressions of the baseline specification for each of the three dependent variables—ratings, foreign currency spreads, and local currency yields. Each independent variable is included both individually and interacted with the NMS dummy. The main tables also show the QLR test results for NMS effects: the respective coefficients from the auxiliary regressions[16] and their *p*-values, plus the *F*-statistic and its *p*-value for the overall QLR effects. We consider 1996–2004 (approximately the central 80 percent of the sample period) for the potential breakpoints, because it appears very unlikely that markets began to form an expectation about the timing of accession before the late 1990s, while it was reality by 2004. Only the results for 2000–05 are shown to conserve space. The most important results—the baseline over the entire sample—are shown in the very right column.

A. All Countries

The models for all three dependent variables have very high explanatory power as measured by the share of the explained variation which is always about 80 percent. This is reassuring, because it makes it unlikely that we are missing any substantial unobserved effects that could be driving the findings for the NMS that we will discuss in the next section.

Considering for now only the coefficients for all countries, in the ratings model (Table 2) each of them has the expected sign and is significant at least at the 5 percent level in all regressions. The only exception is the coefficient on the current account balance, probably driven by a number of balance of payments crises where ratings deteriorated but the current account improved due to import compression. Similarly, for the foreign currency spreads (Table 3), almost all coefficients have the expected sign and are significant at the least at the 5 percent level in all or most regressions; the only exceptions are two coefficients with counterintuitive signs—that on inflation (despite a clearly positive univariate relationship) and the current account balance (probably due to the same reason suspected for the ratings). For the local currency yields (Table 4), the results are less convincing, with some coefficients insignificant or with counterintuitive sign. However, the coefficients on inflation, crisis history, ratings residual, and crisis dummy are consistently highly significant with the expected sign. That the current account balance is highly significant with the intuitive sign is in line with its expected role in determining exchange rate expectations (see Section IV).

To interpret the coefficient magnitudes in the ratings regressions, consider the example of the coefficient of –0.194 on the government balance in the very right column: it implies that an improvement by 1 percent of GDP upgrades the rating by 1/10 of a notch, as one notch is equal to 2 points on our scale. For intuition regarding the coefficients in the foreign currency spreads and the local currency yields regressions, consider the example of the coefficient on the ratings residual, capturing qualitative information considered by the rating agencies: its coefficient implies that a ratings residual of one notch raises the log spread by 8 basis points.

[16] These coefficients effectively show the change in coefficient size relative to the previous recursive estimate.

B. New Member States

As to our main hypothesis, the NMS effects suggest for all three models that these countries are indeed treated differently, as the NMS effects are always highly significant as a group. Moreover, for the ratings, virtually all NMS effects are also individually significant, while they are significant in many cases for the foreign currency spreads, and in several cases for the local currency yields. We thus reject the null in (7) that NMS are not treated differently.

Negative coefficient signs imply "better treatment" of NMS, while positive signs imply "worse treatment." Examining the coefficients for the overall sample in the respective very right columns of Tables 2–4 suggests for all three models that NMS receive more credit from rating agencies and markets for their per capita income which is generally interpreted as a proxy for institutional quality in ratings and spreads regressions. This implies that for the NMS, EU membership interacts with the quality of their domestic institutions to significantly improve ratings and lower spreads relative to emerging markets with otherwise identical fundamentals. Moreover, the ratings regression suggests that the NMS are penalized less than others for a higher debt/exports ratio; the foreign currency spreads regressions suggests that they receive higher credit than others for their government balance position and are penalized less than others for inflation; and the local currency yields regression suggests that they are penalized less than others for qualitative weaknesses measured by the ratings residual. There are, however, also a number of coefficients that the NMS are treated worse in some aspects.

The structural break tests suggest that ratings agencies and markets came to view the NMS differently during the run-up to the EU accession somewhere between 2001 and 2003. Remember that the QLR estimate of the break point is the period where the *F*-test statistic assumes its highest value, which is 2002 for the ratings, 2003 for the foreign-currency spreads, and 2001 for the local currency yields. However, it must be cautioned that the QLR test indicates frequent structural breaks in many of the individual coefficients, as well as for them as a group, probably due to the relatively low degrees of freedom for the NMS effects. However, the coefficients stabilize at the end of the sample period as degrees of freedom rise.

The regression results translate into considerable estimated interest savings for the NMS. Table 5 shows the effects implied by the coefficients estimated over the entire sample period for representative NMS observations. The results of such an exercise should be interpreted only as suggestive, but they have some interesting implications: The net balance of positive and negative effects implies that a generic NMS whose values for all independent variables were at the median would have had a rating 3.4 points (on our scale, i.e., 1.7 actual notches) better than a non-NMS emerging market with similar fundamentals, thanks to a lower penalty on the debt/exports ratio and a higher credit for per capita income. For foreign currency spreads, the total effect is about 70 basis points, due to lower penalties for inflation and general investor risk aversion. For local currency yields, the total effect is about 100 basis points, thanks to higher credits for a better government balance and for per capita income. Applying the 70–100 basis point effects on yield to the NMS average government debt ratio in 2005 suggests average annual savings in the order of 0.2 percent of GDP.

There is also evidence that the net effect varies considerably between countries with relatively good (bad) fundamentals, represented by a generic country whose values for all independent variables all were at the better (worse) quartile.[17] For the ratings and local currency spreads, the "better quartile country" benefits more than the "worse quartile country." However, with regard to the foreign currency spreads, the "worse quartile country" benefits more than "better quartile country." Note again that these estimates should be seen only as suggesting the direction of effects and broad orders of magnitude.

C. Robustness

The robustness tests in Tables 6–8 replicate the baseline regressions for the overall sample with variations of the estimation approach. The columns in the tables all follow the same procedure: (1) apply period weights to account for potential period heteroskedasticity as the variance of spreads, ratings, and yields may be unstable over time; (2) include cross-section random effects to account for potentially unobserved independent random variables; and (3) apply SUR to allow for contemporaneous correlation between the cross-sections, as introduced, e.g., by contagion during crises, and cross-section heteroskedasticity at the same time. Moreover, we check the robustness against (4) excluding the NMS effects and (5) excluding the linear trend (for the spreads and yields regressions), or (for the ratings) squaring all coefficients as one nonlinear alternative to the linear numerical transformation.

The checks suggest for all three models that the results are robust for the "all countries" coefficients, as most them remain consistently highly significant and (where significant) retain the same sign. Not surprisingly, the coefficient magnitudes vary considerably, particularly when random or SUR effects are included. Excluding the trend changes little for ratings and foreign currency spreads, but more for local currency yields, likely due to the fact that the sample here is both in the time and cross-country dimension[18] stronger influenced by the yield convergence during the accession process, implying that the NMS effects are swamped by the trend. For the ratings, squaring all coefficients as a nonlinear alternative to linear transformation obviously alters coefficient sizes, but also reduces explanatory power.[19]

For ratings and foreign currency spreads, excluding the NMS effects has little effect on the "all countries" coefficients. However, the NMS effects in these models are highly sensitive to the application of models that allow for more cross-country heterogeneity (cross-section random effects and SUR), but this is quite natural, because the NMS precisely rely on cross-country heterogeneity in the coefficients, and if this heterogeneity is generally allowed for,

[17] The quartiles are referred to as "better" and "worse" because greater values are considered an improvement in fundamentals for some variables, but a deterioration for others, and vice versa.

[18] The share of NMS observations is higher for the local currency yields regressions than in the others.

[19] This result is in line with the finding of Cantor and Packer (1996) that a linear specification works better than nonlinear alternatives such as logarithmic or exponential functions. Ordered probit techniques relying on the ordinal properties of ratings also yielded inferior results (not shown).

the NMS effects are being undermined. For local currency yields, excluding the NMS effects has a more pronounced effect on the "all countries" coefficients and leads to a drop in the R-squared from 0.83 to 0.44, unsurprising given that the NMS constitute a much larger part of the sample here than in the ratings and foreign currency spreads regressions. At the same time, however, the greater role of NMS in the sample imply that the accession country effects are less sensitive than in the ratings and spreads regressions to the application of models that allow for more cross-country heterogeneity (cross-section random effects and SUR).

III. CONCLUSIONS

We have argued that the recent EU accession of the NMS provides an important real-world experiment to examine the impact of a change in policy credibility on sovereign credit. To test our hypothesis that EU accession has likely to have improved policy credibility in the NMS, at least initially, we have estimated models of foreign sovereign ratings, foreign currency spreads, and local currency yields for emerging markets panel data. We found that the NMS indeed seem to enjoy higher policy credibility than their peers, and that this effect materialized during the run-up to EU accession. Systematic sensitivity analysis suggested that the overall models are robust, but that the effects for the NMS are sensitive to allowing for cross-country heterogeneity in the estimation; this, however, is natural, because the NMS precisely rely on cross-country heterogeneity in coefficients, and we are thus not concerned that it qualifies the results. Moreover, the high explanatory power of our models suggests that the NMS effects are unlikely to be driven by unobserved factors other than EU accession.

The analysis in this paper suggests a number of conclusions. First, and importantly, credibility matters significantly for sovereign ratings and spreads. Even if credibility is provided by an outside anchor as in the case of the NMS, domestic policies still matter, and good behavior is rewarded. Second, exogenous gains in credibility can lead to illusory complacency that has to be guarded against; rather, the opportunity provided by it should be used to improve policies before credibility is weakened or lost altogether.

Third, for the NMS specifically, markets seem to assume that despite the worrying short-term fiscal developments in some cases, the long-term picture looks more favorable. As long as there is credible commitment to EU rules, markets are likely to consider policy shortcomings as temporary. Fourth, this state of affairs provides an opportunity, but also carries risks. The opportunity is that there is scope for a virtuous cycle, whereby markets provide the NMS with some leeway to correct their policies, thus justifying the faith put in them and earning further credibility. The risk is that the absence of market reaction could entrench complacency, leading to a further weakening of the underlying fiscal position, which, at some point, could elicit a sharp market reaction. Finally, if it is the case that credibility explains the so far muted market response, it reinforces the importance of credibility for the current framework of fiscal policy in the EU as a whole.

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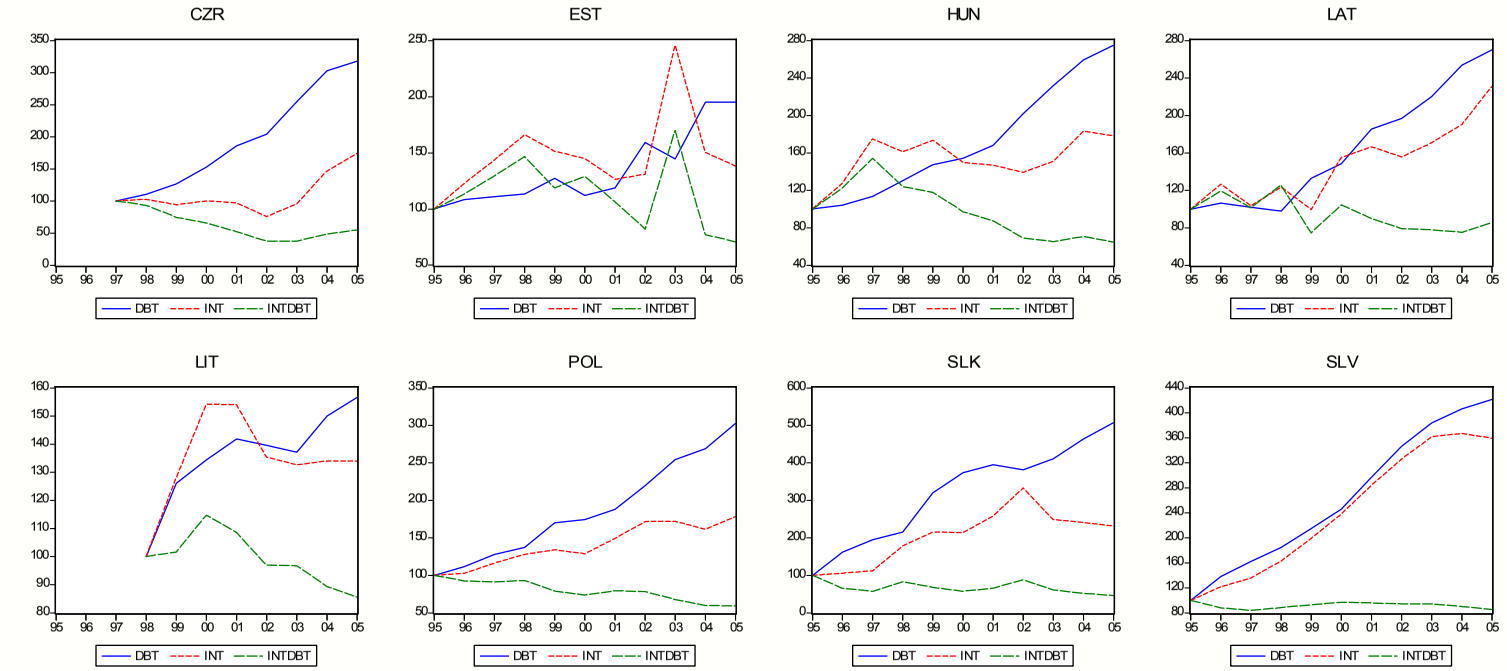
Figure. NMS Government Debt, Interest Expenditure, and Effective Interest Rate (1995 = 100)



Sources: WEO and authors' calculations.
Notes: DBT general government gross debt (Hungary: net), INT…general government interest expenditure, INTDBT…interest expenditure/gross debt. Data underlying the indices is in nominal terms, not GDP ratios.

Table 1. Variable Description

Variable	Exp. Sign	Definition	Source	Mean	Median	St.Dv.	LLC P-Value
Sovereign rating	…	Average of Moody's and S&P foreign-currency sovereign rating; notches were converted linearly into numbers from -42 (best) to 0 (worst)	Moody's, Standard and Poor's	21.84	22.00	6.55	**0.09**
Log(foreign currency spread)	…	EMBI Global spread, or (where unavailable) computed spreads (see text) in basis points	JP Morgan Chase, Datastream	5.75	5.85	1.15	**0.01**
Log(local currency spread)	…	Computed spreads (see text) in basis points	Datastream	2.32	2.27	0.70	1.00
Debt/exports ratio	+	External debt in percent of exports of goods and services	WEO	170.9	148.0	110.9	**0.00**
Reserves/imports ratio	-	International reserves in months of imports of goods and services	WEO	4.59	4.06	3.00	**0.00**
Current account balance/GDP	-	Current account balance in percent of GDP	WEO	0.70	0.46	7.47	**0.00**
Government balance/GDP	-	General government balance in percent of GDP	WEO	-3.09	-2.61	4.47	**0.00**
Per capita income	-	GNI per capita in US-dollars at purchasing power parities	WEO	6677	6044	3778	**0.00**
Inflation	+	Annual percent change in consumer price index	WEO	61.54	7.97	308.04	1.00
Ratings residual	+	Residuals of baseline ratings regression	Authors	0.00	-0.18	2.85	0.57
Crisis dummy	+	Dummy equals 1 if foreign currency spread exceeds 1,000 basis	Authors	0.14	0.00	0.35	**0.00**
Crisis months since 1990	+	Number of months since January 1990 when crisis dummy was equal to 1	Authors	10.76	0.00	20.33	**0.00**
Risk aversion	+	Spread between Aaa- and Baa-rated corporate bonds	Bloomberg, Merrill Lynch	83.24	78.75	21.35	**0.00**
US real interest rate	+	US 10-year treasury note yield minus current annual consumer price inflation in percent	IFS	3.00	3.21	1.13	1.00
EU real interest rate	+	German 10-year treasury note yield minus current annual consumer price inflation in percent	IFS	3.09	3.11	1.04	0.98

Source: Authors.
Notes: WEO…IMF World Economic Outlook Database; IFS…IMF International Financial Statistics; LLC…unit root tests according to Levin, Lin, and Chu (2002)…LLC. The unit root tests include individual intercepts and linear trends. Bold *p*-values are smaller than 0.1.

Table 2. Sovereign Ratings—Rolling Estimates

Sample: 1995M01 to …	2000M12		2001M12		2002M12		2003M12		2004M12		2005M12	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	-20.111	**0.00**	-20.050	**0.00**	-20.217	**0.00**	-20.711	**0.00**	-21.088	**0.00**	-20.822	**0.00**
Debt/exports ratio	0.025	**0.00**	0.025	**0.00**	0.026	**0.00**	0.026	**0.00**	0.027	**0.00**	0.028	**0.00**
Reserves/imports ratio	-0.660	**0.00**	-0.706	**0.00**	-0.724	**0.00**	-0.637	**0.00**	-0.573	**0.00**	-0.542	**0.00**
Current account balance/GDP	0.009	0.66	0.023	0.35	0.042	0.17	0.052	0.11	0.051	0.09	0.057	**0.04**
Government balance/GDP	-0.135	**0.00**	-0.172	**0.00**	-0.228	**0.00**	-0.229	**0.00**	-0.214	**0.01**	-0.194	**0.00**
Per capita income	-5.E-04	**0.00**	-5.E-04	**0.00**	-5.E-04	**0.00**	-5.E-04	**0.00**	-5.E-04	**0.00**	-5.E-04	**0.00**
Inflation	3.E-03	**0.00**	4.E-03	**0.00**	4.E-03	**0.00**	3.E-03	**0.00**	3.E-03	**0.00**	3.E-03	**0.00**
Crisis months since 1990	0.218	**0.00**	0.214	**0.00**	0.205	**0.00**	0.202	**0.00**	0.199	**0.00**	0.191	**0.00**
Accession country effects:												
Constant	1.778	0.36	1.713	0.44	1.638	0.52	2.610	0.32	3.023	0.22	2.681	0.28
	-0.580	**0.00**	-0.064	**0.00**	-0.075	**0.00**	0.971	**0.00**	0.413	**0.00**	-0.342	**0.00**
Debt/exports ratio	-0.045	**0.00**	-0.041	**0.00**	-0.041	**0.00**	-0.046	**0.00**	-0.050	**0.00**	-0.049	**0.00**
	0.003	**0.00**	0.004	**0.00**	0.000	**0.00**	-0.005	**0.00**	-0.004	**0.00**	0.001	**0.00**
Reserves/imports ratio	0.811	**0.01**	0.680	**0.02**	0.760	**0.01**	0.787	**0.00**	0.804	**0.00**	0.682	**0.01**
	-0.130	**0.00**	-0.131	**0.00**	0.080	**0.00**	0.028	**0.00**	0.016	**0.00**	-0.122	**0.00**
Current account balance/GDP	-0.079	0.32	-0.136	0.19	-0.175	0.08	-0.178	0.08	-0.159	0.09	-0.127	0.15
	0.004	**0.00**	-0.057	**0.00**	-0.039	**0.00**	-0.004	**0.00**	0.019	**0.00**	0.032	**0.00**
Government balance/GDP	-0.342	**0.00**	-0.182	0.13	-0.002	0.99	0.007	0.96	-0.026	0.81	-0.058	0.54
	-0.026	**0.00**	0.160	**0.00**	0.180	**0.00**	0.009	**0.00**	-0.033	**0.00**	-0.032	**0.00**
Per capita income	-4.E-04	**0.00**	-3.E-04	**0.02**	-3.E-04	**0.03**	-4.E-04	**0.01**	-4.E-04	**0.00**	-3.E-04	**0.01**
	1.E-04	**0.00**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**
Inflation	0.153	**0.00**	0.167	**0.00**	0.179	**0.00**	0.193	**0.00**	0.195	**0.00**	0.186	**0.00**
	-0.003	**0.00**	0.014	**0.00**	0.012	**0.00**	0.014	**0.00**	0.001	**0.00**	-0.008	**0.00**
Crisis months since 1990	2.845	**0.00**	3.090	**0.00**	3.286	**0.00**	2.873	**0.00**	2.487	**0.00**	2.086	**0.00**
	56.000	**0.00**	0.246	**0.00**	0.195	**0.00**	-0.413	**0.00**	-0.386	**0.00**	-0.401	**0.00**
F-statistic, probability												
Quandt likelihood ratio test	6.2	**0.00**	4.8	**0.00**	**6.4**	**0.00**	2.2	**0.03**	1.9	0.06	…	…
NMS effects, F-stat. P-value	**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**	
Observations, unweighted R^2	1604	0.77	1979	0.77	2391	0.78	2811	0.78	3239	0.78	3671	0.78

Source: Authors' calculations. Notes: All regressions include a linear trend. *P*-values are given next to the coefficient values; bold *p*-values are smaller than 0.05. The coefficients and *p*-values of the QLR test terms are given below the coefficients of the NMS effects.

Table 3. Foreign Currency Spreads—Rolling Estimates

Sample: 1995M01 to …	2000M12		2001M12		2002M12		2003M12		2004M12		2005M12	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	5.989	**0.00**	6.216	**0.00**	6.494	**0.00**	6.754	**0.00**	6.760	**0.00**	6.796	**0.00**
Debt/exports ratio	0.003	**0.00**	0.003	**0.00**	0.003	**0.00**	0.004	**0.00**	0.004	**0.00**	0.004	**0.00**
Reserves/imports ratio	-0.083	**0.00**	-0.083	**0.00**	-0.081	**0.00**	-0.088	**0.00**	-0.089	**0.00**	-0.090	**0.00**
Current account balance/GDP	0.021	**0.00**	0.020	**0.00**	0.026	**0.00**	0.029	**0.00**	0.030	**0.00**	0.032	**0.00**
Government balance/GDP	-0.004	0.61	-0.009	0.28	-0.018	**0.01**	-0.023	**0.00**	-0.021	**0.01**	-0.022	**0.01**
Per capita income	-4.E-05	**0.03**	-4.E-05	**0.03**	-5.E-05	**0.01**	-6.E-05	**0.00**	-5.E-05	**0.00**	-5.E-05	**0.00**
Inflation	-2.E-04	0.18	-2.E-04	0.13	-3.E-04	0.08	-3.E-04	**0.02**	-4.E-04	**0.01**	-4.E-04	**0.00**
Crisis months since 1990	0.017	**0.00**	0.017	**0.00**	0.016	**0.00**	0.017	**0.00**	0.017	**0.00**	0.017	**0.00**
Ratings residual	0.055	**0.00**	0.059	**0.00**	0.064	**0.00**	0.073	**0.00**	0.081	**0.00**	0.082	**0.00**
Crisis dummy	0.648	**0.00**	0.604	**0.00**	0.573	**0.00**	0.499	**0.00**	0.497	**0.00**	0.505	**0.00**
Risk aversion	0.010	**0.00**	0.008	**0.00**	0.003	**0.00**	0.004	**0.00**	0.004	**0.00**	0.004	**0.00**
Accession country effects:												
Constant	-1.239	**0.00**	-0.770	**0.04**	0.702	0.19	1.229	**0.03**	1.131	**0.03**	0.455	0.38
	-0.655	0.12	0.469	0.21	1.472	**0.01**	0.527	0.34	-0.098	0.85	-0.677	0.19
Debt/exports ratio	0.004	**0.03**	0.000	0.92	-0.003	0.30	-0.002	0.37	-0.004	0.07	-0.002	0.20
	0.000	0.97	-0.005	**0.04**	-0.002	0.34	0.001	0.82	-0.002	0.42	0.002	0.32
Reserves/imports ratio	0.084	0.21	0.177	**0.00**	0.224	**0.00**	0.199	**0.01**	0.228	**0.01**	0.192	**0.01**
	0.109	0.10	0.093	0.12	0.047	0.51	-0.025	0.76	0.029	0.72	-0.037	0.64
Current account balance/GDP	-0.064	0.08	-0.048	0.17	0.001	0.98	0.019	0.47	0.007	0.73	-0.019	0.32
	-0.035	0.34	0.016	0.64	0.048	0.12	0.018	0.49	-0.011	0.60	-0.027	0.17
Government balance/GDP	-0.052	0.07	-0.065	0.08	-0.104	**0.00**	-0.123	**0.00**	-0.113	**0.00**	-0.083	**0.01**
	-0.042	0.14	-0.012	0.74	-0.039	0.21	-0.019	0.37	0.010	0.70	0.029	0.36
Per capita income	-1.E-05	0.60	-5.E-05	0.11	-1.E-04	**0.01**	-1.E-04	**0.00**	-1.E-04	**0.00**	-7.E-05	**0.01**
	-1.E-05	0.66	-3.E-05	0.27	-5.E-05	0.16	-2.E-06	0.96	-2.E-05	0.44	5.E-05	0.05
Inflation	-1.E-02	0.21	-1.E-02	0.11	-3.E-02	**0.00**	-4.E-02	**0.00**	-4.E-02	**0.00**	-3.E-02	**0.01**
	-0.007	0.43	-0.001	0.87	-0.020	**0.01**	-0.011	0.33	0.008	0.51	0.006	0.63
Crisis months since 1990	0.737	**0.00**	0.524	**0.00**	0.404	**0.01**	0.322	**0.00**	0.119	0.21	0.134	0.19
	0.336	0.05	-0.213	0.17	-0.119	0.41	-0.083	0.41	-0.202	**0.04**	0.014	0.89
Ratings residual	0.338	**0.02**	0.786	**0.00**	1.214	**0.00**	1.338	**0.00**	1.557	**0.00**	1.403	**0.00**
	-0.037	0.31	0.449	**0.00**	0.428	**0.00**	0.123	**0.00**	0.219	**0.00**	-0.154	**0.00**
Crisis dummy	-0.003	0.21	-0.003	0.11	-0.011	**0.00**	-0.016	**0.00**	-0.012	**0.00**	-0.011	**0.00**
	0.338	**0.02**	0.000	**0.00**	-0.008	**0.00**	-0.005	**0.00**	0.003	**0.00**	0.001	**0.00**
Risk aversion	-0.040	0.27	-0.058	**0.02**	-0.061	0.08	-0.019	0.67	-0.019	0.71	0.016	0.76
	0.006	**0.02**	-0.018	**0.00**	-0.003	**0.00**	0.042	**0.00**	0.000	**0.05**	0.034	**0.04**
F-statistic, probability												
Quandt likelihood ratio test	88.7	**0.00**	419.5	**0.00**	1041.7	**0.00**	**1442.2**	**0.00**	1197.3	**0.00**	…	…
NMS effects, F-stat. P-value	**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**	
Observations, unweighted R^2	1337	0.81	1707	0.80	2119	0.79	2526	0.81	2951	0.83	3383	0.83

Source: Authors' calculations. Notes: Spreads are in logs. All regressions include a linear trend. *P*-values are given next to the coefficient values; bold *p*-values are smaller than 0.05. The coefficients and *p*-values of the QLR test terms are given below the coefficients of the NMS effects.

Table 4. Local Currency Yields—Rolling Estimates

Sample: 1995M01 to …	2000M12		2001M12		2002M12		2003M12		2004M12		2005M12	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	7.032	**0.00**	7.356	**0.00**	7.506	**0.00**	7.586	**0.00**	7.431	**0.00**	7.198	**0.00**
Debt/exports ratio	-0.002	0.37	0.000	0.82	0.000	0.98	0.001	0.76	0.001	0.57	0.002	0.32
Reserves/imports ratio	-0.049	0.45	-0.055	0.32	-0.057	0.23	-0.059	0.18	-0.061	0.09	-0.056	**0.03**
Current account balance/GDP	-0.028	**0.05**	-0.028	**0.03**	-0.028	**0.02**	-0.026	**0.02**	-0.025	**0.00**	-0.023	**0.00**
Government balance/GDP	-0.015	0.49	-0.017	0.30	-0.024	0.21	-0.035	0.06	-0.033	**0.04**	-0.029	**0.02**
Per capita income	6.E-05	0.16	6.E-05	0.09	5.E-05	**0.04**	5.E-05	**0.03**	5.E-05	**0.02**	5.E-05	**0.00**
Inflation	0.023	**0.00**	0.021	**0.00**	0.020	**0.00**	0.018	**0.00**	0.019	**0.00**	0.019	**0.00**
Crisis months since 1990	0.017	**0.04**	0.017	**0.00**	0.019	**0.00**	0.021	**0.00**	0.020	**0.00**	0.020	**0.00**
Ratings residual	-0.001	0.98	0.018	0.56	0.031	0.22	0.047	**0.05**	0.049	**0.01**	0.052	**0.00**
Crisis dummy	0.590	**0.00**	0.523	**0.00**	0.487	**0.00**	0.448	**0.00**	0.424	**0.00**	0.409	**0.00**
Risk aversion	0.002	**0.03**	0.001	0.39	0.000	0.90	0.001	0.40	0.000	0.98	0.000	0.97
US real interest rate	0.018	0.78	0.005	0.94	0.000	1.00	-0.004	0.93	0.000	1.00	0.009	0.77
Accession country effects:												
Constant	3.763	**0.03**	3.618	**0.00**	1.074	0.38	0.508	0.34	0.248	0.70	0.954	0.06
	-6.259	**0.00**	-0.145	**0.00**	-2.545	**0.04**	-0.566	0.29	-0.260	0.69	0.706	0.17
Debt/exports ratio	-0.002	0.82	0.006	0.58	0.005	0.52	0.010	**0.04**	0.012	**0.02**	0.009	**0.05**
	-0.008	**0.00**	0.008	**0.00**	-0.002	0.84	0.006	0.27	0.002	0.75	-0.003	0.50
Reserves/imports ratio	-0.072	0.67	-0.311	0.31	-0.044	0.76	-0.108	0.30	-0.134	0.14	-0.076	0.37
	0.051	**0.00**	-0.239	**0.00**	0.267	0.07	-0.064	0.54	-0.026	0.77	0.058	0.49
Current account balance/GDP	0.005	0.87	0.053	**0.01**	0.061	**0.01**	0.043	**0.03**	0.040	**0.02**	0.023	**0.03**
	-0.064	**0.00**	0.048	**0.00**	0.009	0.72	-0.018	0.38	-0.003	0.85	-0.017	0.13
Government balance/GDP	0.034	0.58	0.051	0.36	0.076	0.19	0.076	**0.03**	0.064	0.05	0.024	0.46
	-0.370	**0.00**	0.017	**0.00**	0.025	0.67	0.000	1.00	-0.012	0.72	-0.040	0.22
Per capita income	-4.E-04	**0.00**	-3.E-04	**0.00**	-1.E-04	0.17	-6.E-05	**0.01**	-6.E-05	**0.02**	-1.E-04	**0.00**
	4.E-04	**0.00**	1.E-04	**0.00**	2.E-04	**0.01**	4.E-05	0.15	3.E-06	0.91	-4.E-05	0.08
Inflation	-0.062	**0.04**	-0.075	**0.00**	-0.041	0.10	-0.018	0.39	-0.008	0.70	-0.008	0.65
	0.815	**0.00**	-0.013	**0.00**	0.035	0.16	0.022	0.30	0.010	0.62	0.000	0.99
Crisis months since 1990	0.825	0.06	0.498	0.18	0.233	0.64	0.024	0.91	0.064	0.71	-0.231	0.11
	-0.084	**0.00**	-0.327	**0.00**	-0.266	0.60	-0.209	0.30	0.040	0.81	-0.295	**0.04**
Ratings residual	-0.103	**0.01**	-0.053	0.19	-0.069	**0.00**	-0.055	**0.03**	-0.060	**0.01**	-0.090	**0.00**
	1.673	**0.00**	0.050	**0.00**	-0.016	0.51	0.015	0.56	-0.005	0.83	-0.030	0.16
Crisis dummy	0.311	0.58	0.463	0.30	0.375	0.42	0.054	0.83	-0.029	0.91	-0.217	0.40
	0.003	**0.00**	0.152	**0.00**	-0.088	0.85	-0.321	0.21	-0.083	0.76	-0.188	0.46
Risk aversion	-0.006	**0.00**	-0.004	**0.05**	-0.003	0.37	-0.002	0.57	-0.001	0.79	-0.002	0.50
	0.050	**0.00**	0.002	**0.00**	0.001	0.84	0.001	0.72	0.001	0.68	-0.001	0.72
US real interest rate	0.657	**0.00**	0.435	**0.00**	-0.062	0.68	-0.092	0.15	-0.028	0.69	-0.130	**0.03**
	-0.040	**0.00**	-0.223	**0.00**	-0.496	**0.00**	-0.031	0.63	0.065	0.35	-0.102	0.08
EU real interest rate	-0.016	0.91	-0.022	0.89	0.164	0.11	0.087	0.35	0.027	0.78	0.050	0.55
	-0.003	**0.00**	-0.005	**0.00**	0.185	0.07	-0.076	0.41	-0.060	0.54	0.023	0.79
F-statistic, probability												
Quandt likelihood ratio test	186.2	**0.00**	**1180.2**	**0.00**	289.5	**0.00**	40.1	**0.00**	80.9	**0.00**	…	…
NMS effects, F-stat. P-value	**0.00**		**0.00**		**0.00**		**0.00**		**0.00**		**0.00**	
Observations, unweighted R^2	515	0.83	645	0.81	792	0.81	948	0.81	1101	0.82	1261	0.83

Source: Authors' calculations. Notes: Yields are in logs. All regressions include a linear trend. *P*-values are given next to the coefficient values; bold *p*-values are smaller than 0.05. The coefficients and *p*-values of the QLR test terms are given below the coefficients of the NMS effects.

Table 5. Illustrative Quantitative Effects of NMS Coefficients

	Observation Values			Sovereign Rating			Foreign Currency Spread			Local Currency Yield		
	"Better" Quartile[a]	Median	"Worse" Quartile[a]	"Better" Quartile[a]	Median	"Worse" Quartile[a]	"Better" Quartile[a]	Median	"Worse" Quartile[a]	"Better" Quartile[a]	Median	"Worse" Quartile[a]
Constant	…	…	…	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt/exports ratio	51.9	75.1	118.8	-2.6	-3.7	-5.9	0.0	0.0	0.0	317.1	458.5	725.4
Reserves/imports ratio	4.3	3.0	2.5	2.9	2.1	1.7	130.1	92.0	75.7	0.0	0.0	0.0
Current account balance/GDP	0.3	-1.9	-5.4	0.0	0.0	0.0	-4.1	23.0	64.4	0.0	0.0	0.0
Government balance/GDP	-1.3	-2.9	-4.8	0.0	0.0	0.0	0.0	0.0	0.0	-54.2	-122.1	-199.2
Per capita income	13351	10608	8220	-4.3	-3.4	-2.7	0.0	0.0	0.0	-547.7	-435.2	-337.2
Inflation	3.9	8.8	22.6	0.7	1.6	4.2	-21.9	-49.4	-127.4	0.0	0.0	0.0
Crisis months since 1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ratings residual	-1.1	0.0	0.9	…	…	…	0.0	0.0	0.0	0.0	0.0	0.0
Crisis dummy	0.0	0.0	0.0	…	…	…	0.0	0.0	0.0	0.0	0.0	0.0
Risk aversion[b]	77.1	77.1	77.1	…	…	…	-132.4	-132.4	-132.4	0.0	0.0	0.0
US real interest rate[b]	3.2	3.2	3.2	…	…	…	…	…	…	0.0	0.0	0.0
Sum	…	…	…	-3.2	-3.4	-2.6	-28.4	-66.9	-119.8	-284.8	-98.8	189.0

Source: Authors' calculations. Notes: [a] The first or third quartile, depending on whether credit quality would be expected to be increasing or decreasing with higher values of a variable. [b] This variable is only period, but not country-variant; the median is thus used for all columns.

Table 6. Sovereign Ratings—Robustness Checks

	1		2		3		4		5	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	-19.612	**0.00**	-14.138	**0.00**	0.468	**0.00**	-18.634	**0.00**	-20.228	**0.00**
Debt/exports ratio	0.027	**0.00**	0.015	**0.01**	0.000	**0.00**	0.026	**0.00**	6.E-05	**0.00**
Reserves/imports ratio	-0.627	**0.00**	-0.617	**0.01**	-0.004	**0.00**	-0.601	**0.00**	-0.035	**0.01**
Current account balance/GDP	0.089	0.19	0.289	**0.00**	0.002	**0.01**	0.066	**0.02**	0.002	0.65
Government balance/GDP	-0.226	**0.00**	-0.052	0.61	-0.002	**0.00**	-0.174	**0.01**	0.009	0.17
Per capita income	-6.E-04	**0.00**	-1.E-03	**0.00**	-4.E-06	**0.00**	-7.E-04	**0.00**	-5.E-08	**0.00**
Inflation	3.E-03	**0.00**	2.E-03	**0.01**	-4.E-05	0.17	3.E-03	**0.00**	1.E-06	**0.00**
Crisis months since 1990	0.178	**0.00**	0.144	**0.00**	0.001	**0.01**	0.186	**0.00**	0.003	**0.00**
Accession country effects:										
Constant	2.014	0.48	-2.833	0.44	0.035	0.66	--	--	-3.658	**0.01**
Debt/exports ratio	-0.048	**0.00**	-0.012	0.12	0.000	0.63	--	--	-1.E-04	**0.01**
Reserves/imports ratio	0.736	**0.03**	0.692	0.07	0.004	0.67	--	--	0.059	0.07
Current account balance/GDP	-0.185	0.06	-0.200	0.07	-0.004	0.35	--	--	0.006	0.67
Government balance/GDP	-0.122	0.30	-0.146	0.43	-0.006	0.19	--	--	0.014	0.16
Per capita income	0.000	0.08	0.000	0.91	0.000	0.49	--	--	2.E-08	**0.04**
Inflation	0.159	**0.00**	0.116	**0.01**	-0.003	0.31	--	--	0.008	**0.00**
Crisis months since 1990	2.002	**0.00**	-0.607	0.39	-0.003	0.92	--	--	2.568	**0.00**
Observations, unweighted R^2	3671	0.79	3671	0.65	3671	0.76	3671	0.76	3671	0.75
Cross-section effects	None		Random		SUR		Weights		Weights	
Period effects	Weights		None		None		None		None	
Variance/covariance method	White period		White period		SUR		White period		White period	
Trend?	Yes		Yes		Yes		Yes		Yes	

Source: Authors' calculations. Notes: Regressions 1–3 alternatively include period weights, cross-section random effects, and SUR effects. Regression 4 excludes the NMS effects. Regression 5 squares all coefficients. Bold *p*-values are smaller than 0.05.

Table 7. Foreign Currency Spreads—Robustness Checks

	1		2		3		4		5	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	6.564	**0.00**	7.045	**0.00**	0.468	**0.00**	6.892	**0.00**	5.729	**0.00**
Debt/exports ratio	0.004	**0.00**	0.004	**0.00**	0.000	**0.00**	0.004	**0.00**	0.005	**0.00**
Reserves/imports ratio	-0.074	**0.00**	-0.064	**0.01**	-0.004	**0.00**	-0.089	**0.00**	-0.096	**0.00**
Current account balance/GDP	0.031	**0.00**	0.035	**0.00**	0.002	**0.01**	0.037	**0.00**	0.033	**0.00**
Government balance/GDP	-0.024	**0.02**	-0.011	0.36	-0.002	**0.00**	-0.023	**0.00**	-0.024	**0.01**
Per capita income	-4.E-05	**0.03**	-2.E-04	**0.00**	-4.E-06	**0.00**	-1.E-04	**0.00**	-7.E-05	**0.00**
Inflation	-4.E-04	**0.05**	-5.E-04	**0.04**	-4.E-05	0.17	-5.E-04	**0.00**	5.E-04	0.27
Crisis months since 1990	0.017	**0.00**	0.017	**0.00**	0.001	**0.01**	0.018	**0.00**	0.014	**0.00**
Ratings residual	0.076	**0.00**	0.064	**0.00**	0.004	**0.00**	0.078	**0.00**	0.052	**0.00**
Crisis dummy	0.622	**0.00**	0.648	**0.00**	0.073	**0.00**	0.497	**0.00**	0.700	**0.00**
Risk aversion	0.004	**0.00**	0.003	**0.00**	0.000	0.07	0.003	**0.00**	0.001	0.51
Accession country effects:										
Constant	0.897	0.07	0.694	0.42	0.035	0.66	--	--	1.136	0.10
Debt/exports ratio	-0.001	0.50	0.003	0.66	0.000	0.63	--	--	-0.009	**0.00**
Reserves/imports ratio	0.114	0.22	-0.094	0.39	0.004	0.67	--	--	0.272	**0.00**
Current account balance/GDP	-0.012	0.56	-0.048	0.10	-0.004	0.35	--	--	-0.031	0.17
Government balance/GDP	-0.067	**0.01**	-0.100	0.09	-0.006	0.19	--	--	-0.062	0.11
Per capita income	0.000	**0.00**	0.000	0.84	0.000	0.49	--	--	0.000	**0.00**
Inflation	-0.029	**0.00**	-0.018	0.25	-0.003	0.31	--	--	0.001	0.95
Crisis months since 1990	0.163	0.11	-0.145	0.56	-0.003	0.92	--	--	-0.105	0.23
Ratings residual	1.218	**0.00**	0.735	**0.02**	0.215	0.05	--	--	0.034	0.50
Crisis dummy	-0.012	**0.00**	-0.010	**0.02**	-0.001	**0.01**	--	--	1.604	**0.00**
Risk aversion	0.026	0.59	0.077	0.09	0.001	0.89	--	--	-0.008	0.05
Observations, unweighted R^2	3383	0.83	3383	0.71	3354	0.98	3383	0.79	3383	0.79
Cross-section effects	None		Random		SUR		Weights		Weights	
Period effects	Weights		None		None		None		None	
Variance/covariance method	White period		White period		SUR		White period		White period	
Trend?	Yes		Yes		Yes		Yes		No	

Source: Authors' calculations. Notes: Regressions 1–3 alternatively include period weights, cross-section random effects, and SUR effects. Regression 4 excludes the NMS effects. Regression 5 excludes the linear trend. Bold *p*-values are smaller than 0.05.

Table 8. Local Currency Yields—Robustness Checks

	1		2		3		4		5	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant	7.256	**0.00**	7.592	**0.00**	7.958	**0.00**	8.080	**0.00**	6.854	**0.00**
Debt/exports ratio	0.000	0.99	-0.001	0.60	-0.002	**0.00**	0.001	0.37	0.003	0.07
Reserves/imports ratio	-0.045	**0.02**	-0.044	0.17	-0.025	**0.00**	-0.119	**0.00**	-0.101	**0.00**
Current account balance/GDP	-0.032	**0.00**	-0.032	**0.00**	-0.046	**0.00**	-0.005	0.64	-0.017	**0.00**
Government balance/GDP	-0.034	**0.00**	-0.036	**0.02**	0.006	0.25	-0.025	0.17	-0.020	0.06
Per capita income	4.E-05	0.06	5.E-05	0.12	-1.E-05	0.05	-5.E-05	**0.00**	8.E-06	0.50
Inflation	0.022	**0.00**	0.020	**0.00**	0.031	**0.00**	0.002	0.25	0.022	**0.00**
Crisis months since 1990	0.022	**0.00**	0.023	**0.00**	0.021	**0.00**	0.016	**0.00**	0.018	**0.00**
Ratings residual	0.038	**0.01**	0.038	0.08	-0.017	**0.00**	0.028	0.22	0.031	**0.02**
Crisis dummy	0.484	**0.00**	0.524	**0.00**	0.516	**0.00**	0.688	**0.00**	0.346	**0.00**
Risk aversion	0.000	0.69	-0.001	0.57	0.001	0.10	-0.004	**0.00**	-0.001	0.26
US real interest rate	0.020	0.40	0.023	0.55	0.078	**0.00**	-0.076	0.12	-0.010	0.68
Accession country effects:										
Constant	0.542	0.15	0.682	0.14	-1.552	**0.00**	--	--	1.277	**0.01**
Debt/exports ratio	0.014	**0.00**	0.011	**0.03**	0.019	**0.00**	--	--	0.012	**0.02**
Reserves/imports ratio	-0.105	0.10	-0.084	0.38	-0.200	**0.00**	--	--	-0.047	0.53
Current account balance/GDP	0.032	**0.02**	0.032	**0.03**	0.050	**0.00**	--	--	0.009	0.31
Government balance/GDP	0.010	0.66	0.029	0.40	-0.028	0.08	--	--	0.027	0.38
Per capita income	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	--	--	0.000	**0.00**
Inflation	-0.003	0.80	-0.016	0.37	0.036	**0.00**	--	--	0.006	0.68
Crisis months since 1990	-0.199	0.09	-0.210	0.22	0.002	0.98	--	--	-0.475	**0.00**
Ratings residual	-0.089	**0.00**	-0.076	**0.00**	-0.031	0.08	--	--	-0.074	**0.00**
Crisis dummy	-0.376	0.07	-0.149	0.57	0.101	0.61	--	--	-0.763	**0.00**
Risk aversion	-0.002	0.40	-0.002	0.50	0.000	0.89	--	--	0.001	0.80
US real interest rate	-0.095	**0.02**	-0.145	**0.03**	-0.136	**0.00**	--	--	-0.153	**0.00**
EU real interest rate	-0.015	0.81	0.069	0.44	-0.077	0.09	--	--	-0.023	0.78
Observations, unweighted R^2	0.85	1261	0.86	1261	0.77	1261	0.44	1556	0.76	1261
Cross-section effects	None		None		SUR		Weights		Weights	
Period effects	Weights		Random		None		None		None	
Variance/covariance method	White period		White period		SUR		White period		White period	
Trend?	Yes		Yes		Yes		Yes		No	

Source: Authors' calculations. Notes: Regressions 1–3 alternatively include period weights, cross-section random effects, and SUR effects. Regression 4 excludes the NMS effects. Regression 5 excludes the linear trend. Bold *p*-values are smaller than 0.05.

APPENDIX: COMPUTATION OF BOND SPREADS

The individual bond spreads are from Datastream, where they are calculated as the spread of the redemption yield over the benchmark curve.[20] Because the maturities for most of the bonds for which the spread is calculated will not exactly match the maturity of the available government benchmark bonds, linear interpolation is used to estimate the yield of a government benchmark with the same maturity as the bond which is analysed. This introduces the assumption that the spread will be constant across maturities. The redemption yield is the discount rate that equates the gross price of the bond to the future interest and capital payments. In practice, a number of factors must be accounted for, e.g., broken interest payments, part-payments, serial redemptions, tax rates, accrued interest methods and settlement. When a bond may be optionally redeemed at an early date, the redemption yield will be to the early date if the clean price of the bond is greater than the final redemption value. Yields in all markets are displayed gross of income and capital gains tax rates.

The following list specifies the individual bonds from which the foreign currency spreads and the local currency yields were computed. Original Datastream notation (including for the country names) is used. The entry of each bond gives the issuing entity, the year of issuance, the coupon rate, the maturity, and the currency (for the foreign currency bonds).

Foreign currency:

CZECH EXPORT BK. 1997 7% 28/05/02 USD
CZECH EXPORT BANK 2002 5 3/4% 24/05/09 USD
NAT.BANK HUNGARY 1991 10 1/2% 16/07/96 USD
HUNGARY 1999 6 1/2% 19/04/06 USD
NAT.BANK HUNGARY 1993 8% 10/06/98 USD
NAT.BANK HUNGARY P93 7.95% 01/11/03 USD
LATVIA 1999 6 1/4% 14/05/04 EUR
LATVIA 2001 5 3/8% 27/11/08 EUR
LITHUANIA 1995 10% 22/12/97 USD
LITHUANIA 1997 7 1/8% 22/07/02 USD
LITHUANIA 2001 65/8% 20/02/08 EUR
LITHUANIA 2003 41/2% 05/03/13 EUR
POLAND 1997 7 1/8% 01/07/04 USD
POLAND 2002 6 1/4% 03/07/12 USD
REP.OF SLOVAKIA1998 9 1/2% 28/05/03 USD
SLOVAK ROAD FUND1999 9 1/2% 28/09/06 EUR
SLOVAKIA 2004 4 1/2% 20/05/14 EUR
REP.OF SLOVENIA1996 7% 06/08/01 EUR
REP.OF SLOVENIA 1999 4 7/8% 18/03/09 EUR

Local currency:

COLOMBIA REPUBLIC OF 2004 11 3/4% 01/03/10
CZECH REPUBLIC 1997 10.55% 14/02/02
CZECH REPUBLIC 2000 6.3% 17/03/07
HUNGARY 02/F 1997 14% 24/06/02
HUNGARY 07/D 2002 6 1/4% 12/06/07
POLAND 1995 13% 12/02/01
POLAND 1997 12% 12/10/02
POLAND 1999 6% 24/05/09
RUSSIA (FLB) 1997 10% 15/03/02
RUSSIA (FLB) 2002 6% 05/10/12

[20] At the short end, the benchmark curve consists of constant maturity US T-bills and BBA EUR repo rates (French T-bill rate before 10/3/01); at the long end, it consists of Datastream's US treasury and Eurozone benchmarks (selected from the German and French benchmark bonds by size, maturity, coupon, and yield).